Productivity, management & public policy II: Determinants of management practice

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Harvard Public Finance Lecture 2 (November 2013)
Summary of Lecture 1

• A lot of performance heterogeneity in public and private sector

• Management may be an important proximate cause of this
  – Advances in measurement & design
  – Identification of causal effects on performance

• But what are the more fundamental factors driving management practices?
  – Why are firms not adopting what seems to be productivity enhancing practices?
  – And what determines how output/activity is allocated between heterogeneous organizations?
Why are “good practices” not adopted?

• All to do with Design. Every organization has the best organizational form as production function/constraints differ by firms/sector
  – Contingency School (Woodward, 1958); core org econ
  – Some evidence of styles adapting to circumstance

• Nevertheless, this view is partial
  – Productivity variation large even within narrow categories (Syverson, 2011)
  – Forcing firms to adopt certain practices improves profits (Bloom et al, 2013)

• Some reasons for non-adoption
  – Information & ability
  – Motivation
  – Co-ordination
Why does management vary across countries and firms?

Some important factors

• **Competition**
• Human Capital
• Governance/Family firms
• Multinationals
• Labor market regulations
• Information
Product Market Competition

• “Monopoly is a great enemy of good management”, Adam Smith, *Wealth of Nations*, Book 1, Chapter XI

• Increasing competition often suggested as a way to improve efficiency in public organizations

• **Methods**
  – Increasing consumer choice (e.g. vouchers; parents can choose between a greater range of public schools)
  – Increasing information helps choice (League Tables; online school test results or police clear-up rates, etc.)
  – Reducing entry barriers (e.g. charter schools)
  – Reducing barriers to exit

• Precise effects will depend on a particular policy reform
  – Many incentive models show potentially perverse effects such as “cream skimming” when multi-tasking & incentives on one observable (e.g. math test scores)
Why should competition raise performance?

- **Selection** (“between-organization” reallocation)
  - Under performing organizations exit (extensive margin)
  - Well performing organizations will grow (intensive margin/reallocation amongst incumbents)

- **Incentives** (“within-organization” improvement)
  - Competition “raises the stakes” (Hart, 1983) for managers, incentivizing them to increase effort (e.g. Schmidt, 1997)
  - In dynamic context this is like the escape competition effect in Aghion et al (2005)
  - BUT countervailing “Schumpeterian” effects. Competition will tend to shrink price-cost margin, so less reward for increased effort
In private sector many studies find competition has positive effect on TFP

• Nickell (1996, JPE) shows changes in competition lead to faster TFP growth within a panel of firms

• Syverson (2004, ReStat). More competitive markets had higher average levels of TFP & less dispersion.

• Trade Liberalizations e.g. Pavcnik (2002, RESTud) also at changes in competition from trade-reforms finding this weeds out low TFP firms

• Surveys: see Van Reenen (2011) or Holmes & Schmitz (2010)
SINGLE INDUSTRY STUDIES OF COMPETITION AND PRODUCTIVITY

- Olley-Pakes (1996) telecom equipment after deregulation
- Schmitz (2005) *Iron Ore manufacturing in 1980s* (fall in transport costs for Brazilian imports)
- Dunne et al (2008) *Cement* in 1980s (overseas imports from e.g. Mexico, Venezuela & Australia)
- Bloom, Draca & Van Reenen (2013) China WTO entry/MFA

All find productivity increased. Some within-plant component. Stress management changes
Sample of 9469 manufacturing and 661 retail firms (private sector panel) and 1183 hospitals and 780 schools (public sector panel). Reported competitors defined from the response to the question “How many competitors does your [organization] face?”
## Competition measures associated with higher management scores in manufacturing

<table>
<thead>
<tr>
<th>Competition proxies</th>
<th>Management (estimated in levels)</th>
<th>Management (estimated in differences)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Import penetration</td>
<td>0.805*** (0.236)</td>
<td>0.608*** (0.230)</td>
</tr>
<tr>
<td>1- Lerner Index¹</td>
<td>17.53* (3.85)</td>
<td>20.68** (6.65)</td>
</tr>
<tr>
<td># of competitors</td>
<td>0.121*** (0.023)</td>
<td>0.120** (0.052)</td>
</tr>
<tr>
<td>Balanced panel</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Obs</td>
<td>2,657</td>
<td>412</td>
</tr>
</tbody>
</table>

**Notes:** Includes SIC-3 industry, country, firm-size, public and interview noise (interviewer, time, date & manager characteristic) controls. Col 1, 2, 4 & 5 clustered by industry*country, cols 3 & 6 by firm
Competition in public sector

• From private sector entrants (e.g. Swedish school & hospital choice reforms)
  – Issues of “cherry-picking”

• Competition between public providers
  – Competition does not need private ownership so long as public managers concerned over demand

• Huge school choice literature

• Focus here on hospital competition
  – Bloom, Propper, Seiler & Van Reenen (2013)
Motivation: Hospital performance & competition

• US evidence generally mixed (Gaynor survey). Mainly cross-sectional evidence, or long run changes over time
• Kessler and McLellan (QJE, 2000), 1985-1994 Medicare patient data. Competition:
  – pre-1990s linked to higher costs/ambiguous quality
  – post 1990s linked to lower costs/higher quality (under ‘managed care’ regime)
• Hard to generate exogenous changes in market structure
MOTIVATION

• We attempt to address these problems by looking at UK public hospitals:

Identification: In UK government control over hospital entry & exit yields an instrument for hospital numbers (political marginality of the district for national Parliament)

“A secret meeting has been held by ministers and Labour Party officials to work out ways of closing hospitals without jeopardising key marginal seats....” Times 15/9/2006
INSTITUTIONAL CONTEXT: COMPETITION IN ENGLISH PUBLIC HOSPITALS (NHS)

• **Payment for hospitals**: ‘Payment by results’: fixed national tariff for treatments & money follows patients

• **Choice**: Patients given choice of 4+ hospitals for elective procedures: electronic bookings system (“Choose and Book”)

• **Information**: “NHS Choices” website info on provider quality

• **Free for patient**: NHS free at point of use, taxpayer funded (private sector small: only 8% of population ever use)

• Physicians, nurses, etc. are salaried employees of hospitals

• Two entry points:
  – Primarily, through General Practitioner serves as gatekeeper local doctor
  – Secondarily, through emergency admissions (ER)
GEOGRAPHY AND THE POLITICIZATION OF THE NHS: CENTRAL LONDON

No. 10 Downing Street (David Cameron)

Treasury (George Osborne)

Department of Health

Parliament
OTHER DATA

- Hospital Episode Statistics data: all England NHS admissions
  - Discharge data (6.25 million records p.a.) on diagnoses, procedures, patient characteristics, location, etc.
  - Use data from population of hospitals to construct measures of market structure & some outcome measures
DEFINING HOSPITAL MARKETS

• Patients dislike being treated far away from home: “transport costs” imply that hospital competition strongly geographic

• Many ways to construct competition measure
  – Number of hospitals
  – Hirschman-Herfindahl Indices (HHI) uses patient flows
    • actual or predicted (Kessler and McClellan, 2000)
  – Patient Demand estimation (Gaynor, Propper & Seiler, 2013)

• Look at many of these, but main concern is endogeneity of hospital numbers which affects all measures
  – e.g. more hospitals in less healthy areas, so may underestimate positive effect of competition
DEFINING COMPETITION I: HOSPITAL NUMBERS

- Propper et al (2007) 15km is median patient travel distance
- So all hospitals within a 30km radius potential rivals
  - Look carefully at alternative market definitions
DEFINING COMPETITION: HERFINDAHL-HIRSCHMAN INDEX (HHI) OF COMPETITION

• **Actual:** Calculates an HHI for each area, and then the HHI for each hospital is averaged across areas patents come from

• **Predicted:** follow Kessler-McClellan (2000, QJE)
  – 7,000 “areas” (MSOAs)
  – Estimate MNL hospital choice 6.25m patients 2005-2006
  – Calculate predicted patient flows based on exogenous characteristics (e.g. Distance, age, gender, severity, etc)
  – Hospital HHI based on (predicted) shares in each area

• **BUT:** hospital numbers still potentially endogenous
CONCENTRATION (HHI, ACTUAL PATIENT FLOWS)

Quartile of HHI:
- Bottom quartile (41)
- Second quartile (40)
- Third quartile (41)
- Top quartile (40)

Lowest Competition
OBTAIN INSTRUMENT FOR COMPETITION BY EXPLOITING POLITICS OF UK HEALTH PROVISION

• In the UK hospital openings and closures centrally controlled

• Politically sensitive

• Construct IV based on whether a hospitals’ rivals/neighbors are in marginal political constituency (i.e. Political districts that were won by only a small margin in the general election)
ARE RIVAL HOSPITALS IN MARGINAL POLITICAL DISTRICTS? IF SO, LESS LIKELY TO EVER CLOSE

- Instrument is the proportion of marginal political districts (held by governing party) in 45 km area around the hospital
MORE HOSPITALS IN (POLITICALLY) MARGINAL DISTRICTS

Number of Hospitals per Million Population

-15 < x ≤ -10: 3.05
-10 < x ≤ -5: 2.66
-5 < x ≤ 0: 3.87
0 < x ≤ 5: 3.78
5 < x ≤ 10: 3.01
10 < x ≤ 15: 2.93
DEFINING MARGINALITY FOR A HOSPITAL

• Use the share of marginal labor constituencies (5% margin) within 45km of each hospital as an IV for hospital numbers

• Controls: overall Labour vote share, population density, demographics, etc. to identify only from marginality

• Show results are robust to varying these thresholds (of marginality % and radii of markets)

• Can politicians influence health outcomes through other mechanisms then keeping hospitals open?
  – Expenditure? No, national formula
  – “Hidden policies”?  
    • So include hospital’s own political marginality
COULD MARGINALITY HAVE A DIRECT EFFECT ON HOSPITAL PERFORMANCE?

- Since hospital markets don’t perfectly overlap can include political marginality in 15km around hospital A in hospital A’s performance regression as additional robustness check
## VARIOUS MEASURES OF COMPETITION ASSOCIATED WITH MANAGEMENT QUALITY

<table>
<thead>
<tr>
<th>Dependent variable: Management Practice Score</th>
<th>Management Practice Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Public Hospitals</td>
<td>0.161*** 0.181***</td>
</tr>
<tr>
<td>(Based on a Fixed Radius of 30km)</td>
<td>(0.042) (0.049)</td>
</tr>
<tr>
<td>Herfindahl-Index (Based on Fixed Radius of 30km)</td>
<td>-0.784** -0.701*</td>
</tr>
<tr>
<td>Herfindahl-Index (Based on Predicted Patient Flows)</td>
<td>-1.960** -1.174</td>
</tr>
<tr>
<td>General Controls</td>
<td>No  Yes  No  Yes  No  Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>161 161 161 161 161 161</td>
</tr>
</tbody>
</table>

**Notes:** SEs clustered at county level (42); all columns include noise controls, area population density & demographic profile (9 cells), hospital type, casemix. “General” = Total admissions, proportion Labour votes, number of political constituencies, London dummy, teaching hospital & Proportion managers with clinical degree, % car ownership
# EFFECT OF POLITICAL PRESSURE ON HOSPITAL NUMBERS

<table>
<thead>
<tr>
<th>Sample</th>
<th>All Hospitals In 1997</th>
<th>All Hospitals In 1997</th>
<th>All Hospitals In 1997</th>
<th>All Hospitals In 1997</th>
<th>All Hospitals In 1997</th>
<th>Interviewed Hospitals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent Variable:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Political Marginality In 1997</td>
<td>4.127***</td>
<td>(1.279)</td>
<td>-0.894***</td>
<td>-1.308***</td>
<td>4.955***</td>
<td></td>
</tr>
<tr>
<td>Change in Marginality 1992 – 1997</td>
<td>4.708**</td>
<td>(2.026)</td>
<td>2.919**</td>
<td>(1.256)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population Controls</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Further Controls</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>212</td>
<td>212</td>
<td>212</td>
<td>212</td>
<td>212</td>
<td>161</td>
</tr>
</tbody>
</table>
### TABLE 4: COMPETITION IMPROVES MANAGEMENT QUALITY

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>OLS Management</th>
<th>IV: 1(^{st}) Stage</th>
<th>IV: 2(^{nd}) Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td># rival hospitals</td>
<td>0.181***</td>
<td>0.366**</td>
<td>0.366**</td>
</tr>
<tr>
<td></td>
<td>(0.049)</td>
<td>(0.168)</td>
<td>(0.168)</td>
</tr>
<tr>
<td>% marginals</td>
<td>7.228***</td>
<td></td>
<td>7.228***</td>
</tr>
<tr>
<td></td>
<td>(2.115)</td>
<td></td>
<td>(2.115)</td>
</tr>
<tr>
<td>F-statistic</td>
<td></td>
<td>11.68</td>
<td></td>
</tr>
<tr>
<td>Full Controls</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Obs</td>
<td>161</td>
<td>161</td>
<td>161</td>
</tr>
</tbody>
</table>

**Notes:** All columns include population density, area age profile (11 categories), Foundation Trust, Number of sites, “case-mix” (22 age/gender bins), respondent tenure & interviewer dummies. **"Full controls"** = Total admissions, proportion Labour votes, number of political constituencies, London dummy, teaching hospital & Proportion managers with clinical degree.
TABLE 4 – CONT.: COMPETITION REDUCES AMI DEATH RATES

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>OLS</th>
<th>First Stage</th>
<th>IV: 2\textsuperscript{ND} Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AMI deaths</td>
<td># Rival Hospitals</td>
<td>AMI deaths</td>
</tr>
<tr>
<td># rival</td>
<td>-1.022***</td>
<td>-1.502**</td>
<td></td>
</tr>
<tr>
<td>hospitals</td>
<td>(0.285)</td>
<td>(0.654)</td>
<td></td>
</tr>
<tr>
<td>% Labour</td>
<td></td>
<td>7.613***</td>
<td></td>
</tr>
<tr>
<td>marginals</td>
<td></td>
<td>(1.851)</td>
<td></td>
</tr>
<tr>
<td>F-Statistic</td>
<td></td>
<td>16.91</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>140</td>
<td>140</td>
<td>140</td>
</tr>
</tbody>
</table>

Notes: All columns include population density, age profile (11 categories), Foundation Trust, #sites, total admissions, “case-mix” specific to AMI admission (22 age/gender bins), respondent tenure & interviewer dummies, %Labour votes, #political constituencies, London dummy, teaching hospital status, % managers with clinical degree, dummy for joint decision making identity of winning party.
THE EFFECT OF THE DEGREE OF POLITICAL MARGINALITY ON HOSPITAL NUMBERS

Notes: Coefficients from 10 separate first stage regressions on basic specification. All columns control for interviewer dummies, population density & age profile (11 dummies) . “Full” = # admissions, casemix (age/gender), Foundation trust status, respondent’s tenure and if manager or clinician, region dummies, # sites, % managers with clinical degree, # constituencies & Labour share of vote in catchment area
EFFECT OF CHANGING THE DEFINITION OF DISTANCE ON MARGINALITY

Notes: Results from 15 first stage regressions of #hospitals on the Labour marginality instrument (identical in specification to those of column (6) in Table 3). We vary (on the x-axis), the size of the catchment area around the hospital in an interval from 10km to 25km. Note that this increases the effective political catchment area (relevant for number of rival hospitals from 30km to 75km).
## TABLE 5: OTHER WAYS POLITICIANS AFFECT HOSPITALS IN MARGINAL DISTRICTS?

<table>
<thead>
<tr>
<th>Type of Regression</th>
<th>IV 1st Stage</th>
<th>IV OLS</th>
<th>IV 1st Stage</th>
<th>IV OLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent Variable</td>
<td>Mgmt # rival Hospitals</td>
<td>Mgmt Expenditure Per Patient</td>
<td>Mgmt Per Patient</td>
<td>Mgmt</td>
</tr>
<tr>
<td># Competing Public Hospitals</td>
<td>0.366** (0.168)</td>
<td>0.336** (0.144)</td>
<td>0.359** (0.169)</td>
<td></td>
</tr>
<tr>
<td>% Marginals within 45km</td>
<td>9.001*** (2.722)</td>
<td>-1.092 (0.916)</td>
<td>3.596 (3.478)</td>
<td></td>
</tr>
<tr>
<td>% Marginals within 15km</td>
<td>-1.092 (0.916)</td>
<td>0.135 (0.371)</td>
<td>3.596 (3.478)</td>
<td></td>
</tr>
<tr>
<td>Physicians per Patient in Local Area</td>
<td>-0.057 (0.052)</td>
<td>-0.057 (0.052)</td>
<td>-0.057 (0.052)</td>
<td></td>
</tr>
</tbody>
</table>

**Observations:**
- 161
- 161
- 161
- 152
- 161

**Notes:** All columns include population density, age profile (11 categories), Foundation Trust, #sites, total admissions, “case-mix” specific to AMI admission (22 age/gender bins), respondent tenure & interviewer dummies, %Labour votes, #political constituencies, London dummy, teaching hospital status, % managers with clinical degree, dummy for joint decision making.
Alternative DiD approaches to the reform obtain qualitatively similar results

- Look before and after 2005 reform which increased patient choice
- Do patients in markets with more hospitals (i.e. greater geographical competition) benefit more from the reforms than those in monopolistic markets?
  - Yes:
    - Patients, esp low income travel further to (good) hospitals post-reform (Gaynor et al, 2013) CABG
    - Where private sector allowed to compete evidence of “cream skimming” (Gibbons et al 2013) ALOS
Are all competitive reforms in UK hospitals successful? No

  - Finds competition caused lower quality (i.e. higher mortality)
  - Explanation: Early reform allowed price & quality competition. Price easily observed but quality largely unobserved & not incentivized: multi-tasking problem
  - Blair reforms in 2000s encouraged quality competition & provided more info but kept regulated national prices
CONCLUSIONS

• Large variation in management practices in hospitals
• Better management associated with better health outcomes
• Competition improves management and health outcomes
• Problems of (Federal) government influence on entry
Interviewer: “Do staff sometimes end up doing the wrong sort of work for their skills?”

NHS Manager: “You mean like doctors doing nurses jobs, and nurses doing porter jobs? Yeah, all the time. Last week, we had to get the healthier patients to push around the beds for the sicker patients”
The difficulties of defining ownership in Europe

*Production Manager:* “We’re owned by the Mafia”

*Interviewer:* “I think that’s the “Other” category……although I guess I could put you down as an “Italian multinational”? ”

Americans on geography

*Interviewer:* “How many production sites do you have abroad?

*Manager in Indiana, US:* “Well…we have one in Texas…”
So why does management vary across countries and firms?

Factors that seem important

- Competition
- Human Capital
- Governance/Family firms
- Multinationals
- Labor market regulations
- Information
Education for Non-Managers and Managers Appear Linked to Better Management (in manufacturing and retail)

Sample of 8,032 manufacturing and 647 retail firms. We did not collect comparable education data in hospitals and schools.
Management and Education: use UNESCO World Higher Education Database university locations (N=9,081)
Distance to the nearest university seems to matter for firm skills and management

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>Manage ment</th>
<th>% firm employees with degree</th>
<th>Manage ment</th>
<th>Manage ment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive time to nearest university</td>
<td>-0.049***</td>
<td>-1.534***</td>
<td>0.789***</td>
<td>3.190***</td>
</tr>
<tr>
<td>% employees with degree in the firm</td>
<td>(0.019)</td>
<td>(0.423)</td>
<td>(0.082)</td>
<td>(1.113)</td>
</tr>
<tr>
<td>Observations</td>
<td>6,406</td>
<td>6,406</td>
<td>6,406</td>
<td>6,406</td>
</tr>
</tbody>
</table>

Notes: Clustered by 313 regions. In final column proportion skilled is instrumented with distance to university. Include industry, regional (e.g. US state), local population density, distance to coast, weather and full set of firm and noise controls.
Which skills matter in expert industries?

- Hospitals very skill and knowledge intensive sector with powerful insider groups (like universities, sports, etc.)
- Is it better to have senior managers who share same expertise as those they manage?
  - Example: Should hospital CEO be clinician? Should the University Dean always be an academic
- Better to have management specialist (2 index skill model)
- Better to have an expert (communication; principal-agent issues)
Explaining the within country variation in hospital management

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample</td>
<td>All</td>
<td>OECD</td>
<td>India</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ln(Hospital Employment)</td>
<td>0.149***</td>
<td>0.149***</td>
<td>0.180***</td>
<td>0.148***</td>
<td>0.178***</td>
<td>0.148***</td>
<td>0.268***</td>
</tr>
<tr>
<td></td>
<td>(0.015)</td>
<td>(0.015)</td>
<td>(0.015)</td>
<td>(0.015)</td>
<td>(0.015)</td>
<td>(0.018)</td>
<td>(0.028)</td>
</tr>
<tr>
<td>Ln(% of Managers with a Clinical Degree)</td>
<td>0.249**</td>
<td>0.253**</td>
<td>0.315**</td>
<td>0.244*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.102)</td>
<td>(0.101)</td>
<td>(0.133)</td>
<td>(0.139)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dummy private for profit</td>
<td>0.333***</td>
<td>0.326***</td>
<td>0.420***</td>
<td>-0.223*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.061)</td>
<td>(0.061)</td>
<td>(0.069)</td>
<td>(0.126)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dummy private not for profit</td>
<td>0.288***</td>
<td>0.282***</td>
<td>0.298***</td>
<td>-0.314**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.056)</td>
<td>(0.055)</td>
<td>(0.059)</td>
<td>(0.151)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of competitors</td>
<td></td>
<td></td>
<td>0.064**</td>
<td>0.045</td>
<td>0.073**</td>
<td>-0.010</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.029)</td>
<td>(0.029)</td>
<td>(0.034)</td>
<td>(0.053)</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>1689</td>
<td>1689</td>
<td>1689</td>
<td>1689</td>
<td>1689</td>
<td>1196</td>
<td>493</td>
</tr>
<tr>
<td>Country dummies</td>
<td>y</td>
<td>y</td>
<td>y</td>
<td>y</td>
<td>y</td>
<td>y</td>
<td>y</td>
</tr>
<tr>
<td>Hospital controls</td>
<td>y</td>
<td>y</td>
<td>y</td>
<td>y</td>
<td>y</td>
<td>y</td>
<td>y</td>
</tr>
<tr>
<td>Region dummies</td>
<td>y</td>
<td>y</td>
<td>y</td>
<td>y</td>
<td>y</td>
<td>y</td>
<td>y</td>
</tr>
<tr>
<td>Noise controls</td>
<td>y</td>
<td>y</td>
<td>y</td>
<td>y</td>
<td>y</td>
<td>y</td>
<td>y</td>
</tr>
</tbody>
</table>

Notes. All columns estimated by OLS. In all columns standard errors are in parentheses under coefficient clustered by hospital. Hospital controls are hospital size (number of employees), age, speciality, percentage of managers with a clinical degree. “Noise controls” are 13 interviewer dummies, the seniority and tenure of the manager who responded, the duration of the interview, and an indicator of the reliability of the information as coded by the interviewer, interviewee type (nurse, doctor or non clinical manager). Number of competitors is constructed from the response to the survey question on number of competitors, and is coded as zero for none (16% of responses), 1 for less than 5 (59% of responses), and 2 for “5 or more” (25% of responses). All regressions include a full set of regional dummies.

Source: Bloom, Sadun & Van Reenen (2013b)
So why does management vary across countries and firms?

I will discuss five factors that seem important

• Competition
• Human Capital
• Governance/Family firms
• Multinationals
• Labor market regulations
• Information
FAMILY-RUN FIRMS TYPICALLY HAVE THE WORST MANAGEMENT

Management scores after controlling for country, industry and number of employees. Data from 9085 manufacturers and 658 retailers. “Founder owned, founder CEO” firms are those still owned and managed by their founders. “Family firms” are those owned by descendants of the founder. “Dispersed shareholder” firms are those with no shareholder with more than 25% of equity, such as widely held public firms.
Family Firms

• Perez-Gonzalez (2006, AER)
  – Announcement that founding CEO will step-down leads to:
    • Big stock rise if the next CEO is not a family-member
    • Big drop if the next CEO is a family member, driven by the family members from “non-selective colleges” (defined as outside top 189 US Colleges)

• Related paper (Bennedsden, Mortenson, Perez-Gonzalez and Wolfenson, 2007 QJE) looks at family CEOs in Denmark, using gender of first born as an instrument
  • *Larger* negative impact of family CEOs in IV than OLS
  • Interpretation is that switch to non-family only in crisis
So why does management vary across countries and firms?

I will discuss five factors that seem important:

- Competition
- Human Capital
- Governance/Family firms
- Multinationals
- Labor market regulations
- Information
MULTINATIONALS APPEAR TO ACHIEVE GOOD MANAGEMENT PRACTICES WHEREVER THEY LOCATE

Sample of 7,303 manufacturing firms, of which 4,926 are purely domestic and 2,377 are foreign multinationals. Domestic multinationals are excluded – that is the domestic subsidiaries of multinational firms (like a Toyota subsidiary in Japan).
Survey example: “Americans do IT better” (Bloom, Sadun and Van Reenen, AER 2012)

Why productivity growth accelerated in US after 1995, but not in EU
US productivity miracle linked to use of IT

• Prices of IT fell rapidly post 1995, and IT using sectors showed rapid TFP growth in the US

• US firms have higher scores on people management so able to use IT better. European firms low scores and struggled to adapt

• Test this by examining US multinationals in Europe. Find:
  • US multinationals much higher impact of IT on output compared to non-US multinationals
  • True even after take-overs with about a 3 year lag
  • Once control for management explains the US advantage

US management ≈ 50% of faster TFP growth than EU after 1995
So why does management vary across countries and firms?

I will discuss five factors that seem important

- Competition
- Human Capital
- Governance/Family firms
- Multinationals
- Labor market regulations
Labor Market Regulation Seems to Inhibit Good Management Practices, Particularly Incentives Management

Note: Averaged across all manufacturing firms within each country (9079 observations). We did not include other sectors as we do not have the same international coverage. Incentives management defined as management practices around hiring, firing, pay and promotions. The index is from the Doing Business database http://www.doingbusiness.org/ExploreTopics/EmployingWorkers/
Some important factors

- Competition
- Human Capital
- Governance/Family firms
- Multinationals
- Labor market regulations
- Information
We asked:

“Excluding yourself, how well managed would you say your firm is on a scale of 1 to 10, where 1 is worst practice, 5 is average and 10 is best practice”

We also asked them to give themselves scores on operations and people management separately
SELF-SCORES UNCORRELATED WITH PRODUCTIVITY

* Insignificant 0.03 correlation with labor productivity, cf. management score has a 0.295
Following MAT we can estimate rough contribution of management to country TFP spread

1. Estimate country differences in size weighted management

2. Impute impact of this on differences in TFP

Requires many assumptions, so only magnitude calculation
Notes: Total weighted mean management deficit with the US is the number on top of bar. This is decomposed into (i) reallocation effect (blue bar) and (ii) unweighted average management scores (red bar). Domestic firms, scores corrected for sampling bias.
First calculate the employment weighted difference in management (from the US as baseline)

30% of US-Greece management gap due to better US reallocation

Notes: Total weighted mean management deficit with the US is the number on top of bar. This is decomposed into (i) reallocation effect (blue bar) and (ii) unweighted average management scores (red bar). Domestic firms, scores corrected for sampling bias.
Second, estimate impact of management on TFP using result from micro regressions and field experiments result: ↑1 SD management ≈ ↑10% TFP

<table>
<thead>
<tr>
<th>Country</th>
<th>Share-Weighted Average Management Deficit with US</th>
<th>TFP GAP with US</th>
<th>Proportion of TFP gap due to Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sweden</td>
<td>-0.25</td>
<td>32.2</td>
<td>7.8%</td>
</tr>
<tr>
<td>Japan</td>
<td>-0.35</td>
<td>33.6</td>
<td>10.4%</td>
</tr>
<tr>
<td>Canada</td>
<td>-0.50</td>
<td>22.3</td>
<td>22.4%</td>
</tr>
<tr>
<td>Great Britain</td>
<td>-0.74</td>
<td>20.3</td>
<td>36.5%</td>
</tr>
<tr>
<td>Italy</td>
<td>-0.81</td>
<td>17.2</td>
<td>47.7%</td>
</tr>
<tr>
<td>France</td>
<td>-0.82</td>
<td>25.3</td>
<td>38.7%</td>
</tr>
<tr>
<td>Brazil</td>
<td>-0.98</td>
<td>59.6</td>
<td>16.9%</td>
</tr>
<tr>
<td>China</td>
<td>-1.01</td>
<td>78.3</td>
<td>14.9%</td>
</tr>
<tr>
<td>Argentina</td>
<td>-1.17</td>
<td>57.3</td>
<td>20.6%</td>
</tr>
<tr>
<td>Portugal</td>
<td>-1.18</td>
<td>24.9</td>
<td>48.2%</td>
</tr>
<tr>
<td>Greece</td>
<td>-1.65</td>
<td>51.0</td>
<td>32.4%</td>
</tr>
<tr>
<td>Unweighted av.</td>
<td></td>
<td>25%</td>
<td></td>
</tr>
</tbody>
</table>

Assume one sd increase in management increases TFP by 10%. Regressions suggest about 5% to 15% depending on specification. TFP data from Jones and Romer (2010).
Preliminary estimates of contribution of management to within-country TFP spread ~1/3

<table>
<thead>
<tr>
<th>Country</th>
<th>90-10 gap in: TFP Management</th>
<th>% accounted for by management</th>
<th>TFP spread source:</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>90% 2.7 SDs</td>
<td>30%</td>
<td>Syverson (2004)</td>
</tr>
<tr>
<td>UK</td>
<td>110% 3.0 SDs</td>
<td>38%</td>
<td>Criscuolo, Haskel and Martin (2003)</td>
</tr>
</tbody>
</table>

Note: Management share imputed assuming that ↑1 SD management ≈ ↑ 10% TFP
Using US MOPs on entire firm size distribution US figure is 21%
Conclusions & Summary

- Advances in measurement of management & identification of effects in performance
- Management appears to be important in accounting for large differences in performance in private & public sector
- Understanding the causes of the (non) adoption of management techniques is still rudimentary – like other technologies
- What can we learn from the study of the generation and adoption of technologies? And what are appropriate innovation policies?
  – Focus of Lecture 3
Some Outstanding Research Questions

- Can management practices all be accounted for by the human capital of employees? Or is there an additional factor of culture/firm DNA/TFP?
- Why do firms fail to adopt what appears to be best practice? How much is behavioural?
- What are the market failures that justify policy interventions to improve management? And what is most effective?
MY FAVOURITE QUOTES:

The traditional British Chat-Up

[Male manager speaking to an Australian female interviewer]

*Production Manager:* “Your accent is really cute and I love the way you talk. Do you fancy meeting up near the factory?”

*Interviewer* “Sorry, but I’m washing my hair every night for the next month….”
Production Manager: “Are you a Brahmin?’

Interviewer “Yes, why do you ask?”

Production manager  “And are you married?”

Interviewer “No?”

Production manager “Excellent, excellent, my son is looking for a bride and I think you could be perfect. I must contact your parents to discuss this”
MANAGEMENT PRACTICE SCORES ALSO HIGHER WITH MORE COMPETING HOSPITALS

<table>
<thead>
<tr>
<th>Number of Competitors</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>2.59</td>
</tr>
<tr>
<td>1 to 5</td>
<td>2.69</td>
</tr>
<tr>
<td>5 to 10</td>
<td>2.82</td>
</tr>
<tr>
<td>More than 10</td>
<td>2.90</td>
</tr>
</tbody>
</table>

Notes: # rival hospitals as perceived by manager
Source: Bloom, Sadun and Van Reenen (2013b)
ALTERNATIVE HHI-BASED COMPETITION MEASURE

• Follow Kessler-McLennan (2000, QJE)
• Standard HHI uses actual patent flows.
  – 7,000 MSOAs (“areas”) of ~7,200 people (cf US zipcodes), k = 1,….,K
  – Calculate a HHI based on shares in all of the j =1,…,J hospitals in England
  – Use all elective admissions (i=1,….,n); n= 13m per year from HES 2003/4 - 2006/7
• But flows potentially endogenous (e.g. more patients to better hospitals)
  – Exploit information from HES to estimate MNL logit of patient choice of hospital
Characteristics in MNL

• Choice probabilities depend on:
  – **Characteristics of patient**
    • Gender, age, severity of condition (ICD)
  – **Characteristics of hospital**
    • Teaching/non-teaching; dummy for big/small;
  – **Characteristics of patient-hospital match**
    • Physical distance between patient and hospital
    • Interactions of distance and hospital type
    • Interactions of patient characteristics and hospital type
Model of patient choice

\[ U_{ij} = \sum_{h=1}^{2} \left\{ \beta_1^h \left( d_{ij} - d_{ij}^h \right) \times z_j^h + \beta_2^h \left( d_{ij} - d_{ij}^h \right) \times (1 - z_j^h) \right\} \]

\[ + \sum_{h=1}^{2} \left\{ \beta_3^h \left( d_{ij} - d_{ij}^h \right) \times z_j^h + \beta_4^h \left( d_{ij} - d_{ij}^h \right) \times (1 - z_j^h) \right\} \]

\[ + \sum_{h=1}^{2} \left\{ \beta_5^h \text{ female}_i \times z_j^h + \beta_6^h \text{ young}_i \times z_j^h + \beta_7^h \text{ old}_i \times z_j^h \right\} \]

\[ + \sum_{h=1}^{2} \left\{ \beta_8^h \text{ lowseverity}_i \times z_j^h + \beta_9^h \text{ highseverity}_i \times z_j^h \right\} + e_{ij} \]
Predicted HHIs based on predicted patient flows based on MNL model of hospital choice

\[ HH\hat{I}_j = \sum_{k=1}^{K} \left( \frac{\hat{n}_{kj}}{\hat{n}_j} \right)^2 HH\hat{I}_k, \quad HH\hat{I}_k = \sum_{j=1}^{J} \left( \frac{\hat{n}_{jk}}{\hat{n}_k} \right)^2 \]

\[ \hat{n}_j = \sum_{i=1}^{n} \hat{\pi}_{ij}, \quad \hat{n}_k = \sum_{i=1}^{n_k} \sum_{j=1}^{J} \hat{\pi}_{ij} = \sum_{i=1}^{n_k} 1 = n_k, \quad \hat{n}_{kj} = \hat{n}_{jk} = \sum_{i=1}^{n_k} \hat{\pi}_{ij} \]
WHY SHOULD COMPETITION IMPROVE HOSPITAL MANAGEMENT AND PERFORMANCE?

• Classical incentive effects of competition
  – NHS has competition in a fixed price regime (where \( p > mc \))
  – Hospital CEOs care about profits (firing, pay, etc.), but also care about other objectives
  – Competition increases the value of managerial effort through profit effect
  – But formally ambiguous effects

• Other competition-based mechanisms for increasing managerial effort?
  – *Yardstick competition*: More local hospitals enables more effective regulation?
  – *Market Selection effects*: Not strong
SOME ISSUES

• Price regulation important for result

• Positive result. Normatively, welfare could fall if “too much” quality/effort

• Scale issues
## HOSPITAL PERFORMANCE & MANAGEMENT: England 2006

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality rate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>(28 day) from emergency</td>
<td>17.08</td>
<td>2.21</td>
<td>4.90</td>
<td>1.61</td>
<td>9.69</td>
<td>2.70</td>
<td>2.25</td>
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<tr>
<td>AMI</td>
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<td>Mortality rate</td>
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<tr>
<td>from emergency surgery</td>
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<td>Total waiting list</td>
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<tr>
<td>1000’s</td>
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<tr>
<td>In-hospital MRSA</td>
<td></td>
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<tr>
<td>infection rate</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Expenditure per patient</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Intention of staff to</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>leave in next 12 months</td>
<td></td>
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<tr>
<td>Healthcare Commission</td>
<td></td>
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</tr>
<tr>
<td>rating</td>
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</tr>
</tbody>
</table>

Mean: 17.08  2.21  4.90  1.61  9.69  2.70  2.25

Management Practices Score:

-0.968**  -0.099**  -0.207*  -0.081  -0.681**  -0.031**  0.108***

(0.481) (0.044) (0.121) (0.062) (0.260) (0.013) (0.041)

Obs: 140  157  160  160  152  160  161

Notes: Management index is z-scored (mean=0, sd=1). SE clustered at county level (42). All columns control for casemix (e.g. age-gender of patient), size, London dummy, % managers with clinical degree, % auto ownership & “noise controls” (interviewer dummies, respondent’s tenure & whether manager (or clinician).
A SIMPLE MODEL (GAYNOR, 2006)

• Hospital CEO maximizes utility (increasing in hospital profit) by choosing effort, \( e \), raising hospital quality \( z(e) \)
• Price regulated at national tariff \( p \) (free to consumers)
• Hospital demand \( q(z(e), S) \), \( S \) = other factors such as distance to hospital for patients, market size, etc.

\[
U = pq(e) - c(q(e), e) - F
\]

\[
\frac{e}{q} = \left( \frac{p - c_q}{c_e} \right) \eta^q_e (N)
\]

• Elasticity of demand wrt quality increases in #hospitals \((N)\); so elasticity of demand wrt effort \( \eta \) also increases in \( N \)
• Therefore, equilibrium managerial effort increasing in competition
ROBUSTNESS AND EXTENSIONS

• Definition of marginality

• Does number of hospitals just proxy local labour markets?

• Does number of hospitals just mean more local capacity?

• Do politicians have other ways to improve hospital management & performance other than via hospital numbers?
McCormack, Propper & Smith (2013)
http://www.bristol.ac.uk/cmpo/publications/papers/2013/wp308.pdf

• Implement BVR management survey in 248 departments of 112 UK universities
  – Interview Heads of up to 4 depts: Psychology, Computer Science, Business & Management, English
• People/incentive (but not other) questions related to better performance:
  – Teaching (NSS)
  – Research (RAE)
  – “Good university” guides
• Lots of heterogeneity within a university across departments (unrelated to subject)
• Older research intensive universities score better than newer teacher focused universities
Delfgaauw, Dur, Propper & Smith (2011)
http://papers.tinbergen.nl/11094.pdf

- Residential Social Care: 200 fostering/adoption agencies & nursing homes in UK
- Some of these are for-profit (FP) & some are not for profit (NFP)
- Management scores worse in NFP than FP
- Performance
  - Staff turnover
  - Regulatory rating as being a low or high performer (binary)
- Positive relationship between management and performance holds in FP, but not in NFP
Senior leaders as experts

• In panel also find that hospitals which increased % of managers with clinical skills had fastest improvements in management

• Other evidence
  – Universities (Goodall, 2006, 2009; McCormack et al, 2013)
  – Basketball players (Goodall et al, 2011)
  – Soccer (Bridgewater et al, 2009)
Multinationals use similar people management practices in their overseas affiliates.
<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
</tr>
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<tbody>
<tr>
<td>Fixed effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USA × ln(C/L)</td>
<td>0.1790***</td>
<td>0.0784</td>
<td>0.0518</td>
<td>0.0192</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USA ownership × computers per employee</td>
<td>(0.0733)</td>
<td>(0.0720)</td>
<td>(0.0713)</td>
<td>(0.0785)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MNE × ln(C/L)</td>
<td>-0.0263</td>
<td>-0.0235</td>
<td>0.0218</td>
<td>0.0235</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-US multinational × computers per employee</td>
<td>(0.0586)</td>
<td>(0.0553)</td>
<td>(0.0547)</td>
<td>(0.0550)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>People management</td>
<td>0.0271</td>
<td>0.0271</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>People management × ln(C/L)</td>
<td>0.1451***</td>
<td>0.1404***</td>
<td>0.1284*</td>
<td>0.0994*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In(K/L)</td>
<td>0.2401***</td>
<td>0.1838***</td>
<td>0.1782***</td>
<td>0.1791***</td>
<td>0.2347**</td>
<td>0.2316***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non IT capital per employee</td>
<td>(0.0163)</td>
<td>(0.0284)</td>
<td>(0.0276)</td>
<td>(0.0276)</td>
<td>(0.0926)</td>
<td>(0.0882)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ln(L)</td>
<td>-0.0182</td>
<td>0.0421</td>
<td>0.0421</td>
<td>0.0409</td>
<td>-0.2182</td>
<td>-0.2347</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labor</td>
<td>(0.0162)</td>
<td>(0.0360)</td>
<td>(0.0344)</td>
<td>(0.0349)</td>
<td>(0.2600)</td>
<td>(0.2497)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ln(C/L)</td>
<td>0.1256***</td>
<td>0.1430***</td>
<td>0.1463***</td>
<td>-0.0493</td>
<td>-0.2282</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computers per employee</td>
<td>(0.031)</td>
<td>(0.0284)</td>
<td>(0.0303)</td>
<td>(0.0596)</td>
<td>(0.1738)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>0.2548***</td>
<td>0.0779</td>
<td>0.1111**</td>
<td>0.0837*</td>
<td></td>
<td>0.2601***</td>
<td>0.2150***</td>
<td></td>
</tr>
<tr>
<td>USA ownership</td>
<td>(0.0438)</td>
<td>(0.0481)</td>
<td>(0.0446)</td>
<td>(0.046)</td>
<td></td>
<td>(0.0742)</td>
<td>(0.0732)</td>
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</tr>
<tr>
<td>MNE</td>
<td>0.1909***</td>
<td>0.1597***</td>
<td>0.1604***</td>
<td>0.1618***</td>
<td></td>
<td>0.0492</td>
<td>0.0367</td>
<td></td>
</tr>
<tr>
<td>Non-US multinational</td>
<td>(0.0304)</td>
<td>(0.0363)</td>
<td>(0.0355)</td>
<td>(0.0357)</td>
<td></td>
<td>(0.0596)</td>
<td>(0.0591)</td>
<td></td>
</tr>
<tr>
<td>ln(d)</td>
<td>0.0433**</td>
<td>0.0375**</td>
<td>0.0370**</td>
<td></td>
<td></td>
<td>0.0585**</td>
<td>0.0359</td>
<td></td>
</tr>
<tr>
<td>Percentage employees with a college degree</td>
<td>(0.0183)</td>
<td>(0.0184)</td>
<td>(0.0184)</td>
<td></td>
<td></td>
<td>(0.0293)</td>
<td>(0.0296)</td>
<td></td>
</tr>
<tr>
<td>ln(d) × ln(C/L)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.0700</td>
</tr>
<tr>
<td>Percentage employees with a college degree × computers per employee</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.0484)</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>9,463</td>
<td>2,555</td>
<td>2,555</td>
<td>2,555</td>
<td>2,555</td>
<td>2,555</td>
<td>2,555</td>
<td>2,555</td>
</tr>
<tr>
<td>Test USA × ln(C/L) = MNE × ln(C/L), p-value</td>
<td>0.189</td>
<td>0.0189</td>
<td>0.2419</td>
<td>0.6360</td>
<td>0.9565</td>
<td>0.0095</td>
<td>0.0253</td>
<td></td>
</tr>
</tbody>
</table>